REMARKS

The final Office Action mailed December 31, 2009 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Rejection(s) Under 35 U.S.C. § 103(a)

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kaneko *et al.* (U.S. pat. no. 5,932,990; hereinafter, "Kaneko"), Nakashimo (U.S. pub. no. 2002/0109483; hereinafter, "Nakashimo") and Baldwin *et al.* (U.S. pat. no. 6,583,603; hereinafter, "Baldwin"). Applicants respectfully traverse.

Claims 1 and 3 have been amended to include the feature "said charging current limiting circuit supplies said charging current to said lithium ion battery while said DC power supply apparatus supplies a current to said load device." In this manner, the claims explicitly describe that the lithium ion battery is supplied with the charging current by the DC power supply apparatus through the charging current limiting circuit while the load device is supplied with the current by the DC power supply apparatus, directly. This is because the lithium ion battery and the charging current limiting circuit connected in series with the lithium ion battery are included in the charging path which is connected to the DC power supply apparatus in parallel with the load device. In this manner also, the concern in the Office Action that "the features upon which applicant relies (i.e., the charging current limiting circuit can supply sufficient power to the lithium ion battery while the DC power supply apparatus sufficiently supplied a drive current to the load) are not recited in the rejected claim(s)" is addressed.

As previously pointed out, Applicants respectfully disagree with the contention in the

Office Action that "Nakashimo teaches a power supply system comprising a switch (102) that is provided with such function that disconnects a battery (101) from both a DC power supply apparatus (104) and a load device (103) when the cell voltage of said battery (101) shows over-charging or over-discharging of said battery (101) (Par, 5 and 30)" because Nakashimo does not teach that (i) the switch (102) has the function that disconnects a battery (101) from both a DC power supply apparatus (104) and a load device (103). In addition, a switch of the present invention recited in claims 1 and 3 further has a function that connects said lithium ion battery to both of said DC power supply apparatus and said load device. In this respect, Nakashimo fails to teach that (ii) the switch (102) has the function that connects the battery (101) to both the DC power supply apparatus (104) and the load device (103). This is because the power supply unit shown in FIG. 4 of Nakashimo has external terminals +Vo and -Vo between which either the load 103 or the DC power supply apparatus (charger) 104 is connected. When the load 103 is connected between the external terminals +Vo and -V0, electric power which is charged in the battery 101 is supplied to the load 103. When the electric power charged in the battery 101 is exhausted, the charger 104 is connected between the external terminals +Vo and -Vo in place of the load 103 to charge the battery 101 (see, for instance, paragraphs [0006] to [0008]). Therefore, the switch 102 disconnects only the load 103 from the battery 101 when the over-discharged state of the battery is detected by the control circuit 110 in the case that the load 103 is connected between the external terminals +Vo and -Vo. Similarly, the switch 102 disconnects only the charger 104 from the battery 101 when the overcharged state of the battery is detected by the control circuit 110 in the case that the charger 104 is connected between the external terminals +V0 and -V0.

Thus, Nakashimo's switch 102 does not have, in its OFF state, the function that

disconnects a battery 101 from both a DC power supply apparatus 104 and a load device 103. In addition, the switch 102 does not have, in its ON state, the function that connects the battery 101 to both the DC power supply apparatus 104 and the load device 103. Nakashimo's power supply unit has disadvantages in that it requires switching or disconnection of the connection of the secondary battery from the DC power supply apparatus and the load. A power supply system that supplies uninterrupted power, like that of the present invention, cannot be achieved in Nakashimo.

With respect to Baldwin, the Office Action states that "Baldwin teaches a charging current limiting circuit ... that is connected in series with a battery and supplies a charging current of an arbitrary value independent of load fluctuation in the charging path of the lithium ion battery." Applicants respectfully disagree. The Office Action relies upon the description at column 9, lines 3-10 of Baldwin to support this contention. However, Baldwin merely discloses at column 9, lines 3 -10 that the rectifier 8 is equipped with a current limiting function to prevent the battery strings 14 from receiving damaging excess recharge current levels. Even if it is assumed that the rectifier 8 includes a charging current limiting circuit to carry out the above current limiting function, Baldwin fails to disclose that such alleged charging current limiting circuit supplies a charging current of an arbitrary value independent of load fluctuations.

This is because Baldwin's alleged charging current limiting circuit is included in the rectifier (DC power supply apparatus) 8, not in a charging path which is connected to the DC power supply apparatus 8 in parallel with the load 10.

In clear contrast, the charging current limiting circuit (4) of the present invention is

included in the charging path which is connected to the DC power supply apparatus (2) in parallel with the load device (3), as clearly recited in claims 1 and 3. This structural feature explicitly means that the charging current limiting circuit (4) is distinctly and separately provided from the DC power supply apparatus (2). Because the load device (3) and the charging path (including the lithium ion battery (1), the charging current limiting circuit (4), the switch (6)) are connected to the DC power supply apparatus (2) in parallel, the charging current limiting circuit (4) can supply "a charging current of an arbitrary value independent of load fluctuations in said charging path", as claimed. (Emphasis added).

Therefore, none of the references, Nakashimo, Kaneko and Baldwin discloses the "switch" or "charging current limiting circuit" as claimed in claims 1 and 3 of the present invention and, therefore, the present invention cannot be derived from a combination of Kaneko, Baldwin and Nakashimo. Moreover, no reasonable combination of Kaneko, Nakashimo and Baldwin teaches or suggests the above-noted structural features of the present invention.

With Respect to comments in "Response to Arguments" section of the Office Action, it is stated therein that "it is noted that the features upon which applicant relies (i.e., the charging current limiting circuit can supply sufficient power to the lithium ion battery while the DC power supply apparatus sufficiently supplied a drive current to the load) are not recited in the rejected claim(s)". In this respect, however, claims 1 and 3 clearly recite that "a switch that is provided with such function that ... connects said lithium ion battery to both of said DC power supply apparatus and said load device in a normal state". It is respectfully submitted that this structural feature makes it possible to supply sufficient power to the lithium ion battery while the DC power supply apparatus sufficiently supplied a drive current to the load. In addition, as

explained above, the amendments to claims 1 and 3 fully address this allegation.

Because of the structural features of the present invention, the switch 6 disconnects or connects both of the DC power supply apparatus 2 and said load device 3. The switch 6 disconnects the lithium ion battery from both of the DC power supply apparatus 2 and the load device 3 when the cell voltage of said lithium ion battery shows overcharging or over-discharging of said lithium ion battery. This structure makes it possible to protect the lithium ion battery 1 from overcharging and over-discharging as described on page 7, line 19, *et seq.* in the specification. Further, when the switch 6 disconnects the lithium ion battery 1 (or the charging path) from both of the DC power supply apparatus 2 and the load device 3, the DC power supply apparatus 2 can supply electric power to the load device 3.

Conclusion

In view of the preceding discussion, Applicants respectfully urge that the claims of the present application define patentable subject matter and should be passed to allowance.

If the Examiner believes that a telephone call would help advance prosecution of the present invention, the Examiner is kindly invited to call the undersigned attorney at the number below.

Please charge any additional required fees, including those necessary to obtain extensions of time to render timely the filing of the instant Response to Office Action, or credit any overpayment not otherwise credited, to our deposit account no. 50-3557.

Respectfully submitted,
Nixon Peabody LLP

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